

What Is Claimed Is:

SubBT 1. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, the housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, the housing defining a groove therein for positioning under and adjacent the skin of the patient, wherein the groove is of sufficient tactility to convey to an operator the subcutaneous disposition and attitude of said housing.

2. A port device in accordance with claim 1 wherein the port device housing is provided with a smooth, generally rounded profile, and the groove is provided with smooth and rounded contours.

3. A port device in accordance with claim 2 wherein said housing receiving means comprises an entrance in said housing, and surfaces for guiding an

4. A port device in accordance with claim 3 wherein said surfaces include a front porch disposed adjacent the entrance and extending proximally therefrom.

6. A port device in accordance with claim 4 wherein said surfaces include an overhang overlying a portion of the front porch and disposed adjacent the entrance and opposed to the front porch.

PROSL-7

8. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, the housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, the housing defining a raised surface, aligned with the needle receiving apparatus, for positioning under and adjacent the skin of the patient, wherein the raised surface is of sufficient tactility to convey to an operator the subcutaneous location of the needle receiving apparatus.

9. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, the housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, the needle receiving apparatus comprising an opening in

PROSL-7

9. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, the housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, the needle receiving apparatus comprising an opening in

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14. A port device in accordance with claim 13 wherein the front porch surface is provided with a groove therein aligned with the opening.

15. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, said housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, said housing defining a ledge within a profile of said housing and having a suture orifice therein and extending therethrough.

16. A port device in accordance with claim 15 wherein said housing is provided with a smooth, generally rounded exterior and said ledge is disposed within a recess defined within the exterior.

17. A port device for implanting in a patient for subcutaneous access to the vascular system of the

patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, said housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, said housing having a smooth, generally rounded exterior.

18. A port device in accordance with claim 17 wherein said housing is of a generally tear-drop configuration.

19. A port device in accordance with claim 17 wherein said housing defines a groove therein for positioning under and adjacent the skin of a patient, the groove being of sufficient tactility to convey to an operator the subcutaneous disposition and attitude of the housing, the groove having smooth and rounded contours and being devoid of protruding sharp edges.

20. A port device in accordance with claim 17 wherein the needle receiving apparatus comprises an aperture in said housing, and surfaces for guiding an

incoming needle from a first location removed from the aperture to a second location coincident with the aperture.

21. A port device in accordance with claim 17 wherein said surfaces include a front porch, and the front porch is devoid of protruding sharp edges.

22. The port device in accordance with claim 17 wherein said housing defines a ledge within the smooth rounded exterior of said housing and having a suture orifice therein and extending therethrough.

23. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and lock means for locking a catheter to the housing, said lock means comprising a collet for receiving the catheter when said collet is in an open condition, and a lock member responsive to application of a cam means to close said collet with the catheter therein, to lock the catheter in said collet and thereby in said housing.

24. A port device in accordance with claim 23 wherein said device is provided with an outlet tube, said collet being disposed around the outlet tube to define an annulus *AB, spec.* therebetween adapted to receive the catheter, and the lock member being disposed around the collet, the lock member having inwardly directed protrusions *AB, spec.* said lock member being movable by the cam means to cause the lock member protrusions to engage the collet, to cause the collet to engage the catheter which is thereby pressed against the outlet tube, to lock the catheter to the outlet tube.

25. A port device in accordance with claim 24 wherein said device is provided with an internal lock bolt which is bifurcated to provide opposed legs, each by having a flange extending outwardly therefrom, the lock member having a bore therethrough, the lock bolt being disposed in the bore, the bore having an inwardly-extending ridge *AB, spec.* engaging the flanges and adapted to retain the flanges on a first side of the ridge to permit the lock member to remain in a position permitting the collet to remain in an open position and

1/2 each is referring to lock point or opposed legs.

spaced from the outlet tube, the lock member being movable by the application of the cam means such that the lock member ridge causes inward movement of the lock bolt legs, permitting the lock member ridge to override the lock bolt flanges and the flanges to reposition to a second side of the ridge to cause the lock member to engage the collet, causing the collet to engage the catheter disposed on the outlet tube, to press the catheter against the outlet tube to lock the catheter to the tube.

26. A locking tool for locking a catheter to a port device housing having therein an outlet tube, the catheter being disposed on the outlet tube, a collet disposed around the catheter, a lock member disposed around the collet, and a lock bolt fixed in the device and having a flange thereon engaged with a ridge in the lock member to hold the lock member in a position wherein the catheter is not locked to the outlet tube, and wherein upon moving of the lock member such that the lock member ridge overrides the lock bolt flange and causes the lock member to engage the collet, causing the collet to engage the catheter to press the

catheter against the outlet tube to lock the catheter to the outlet tube, the locking tool comprising:

a rod;

a handle fixed to a first end of said rod;

a cam portion eccentrically mounted on a second end of said rod; and

a pin extending axially from said cam member and disposed eccentrically of said cam member;

wherein said pin is insertable through a slot in the lock member and said cam portion is engageable with a wall of the housing, and said tool is rotatable to bring said cam portion to bear on said housing to cause said lock member to move on said lock bolt to cause the lock member ridge to override the lock bolt flange.

27. A locking tool in accordance with claim 26 in combination with a second tool for unlocking the catheter for release from the outlet tube, the second tool comprising:

a planar blade portion for disposition on a surface of the housing, the blade portion defining an aperture; and

the end of the blade portion for the housing;

second tool permitting the pin to pass therethrough until the cam member engages a surface of the housing;

the housing being pivotally movable in the housing portion thereof against the lock member on the lock bolt to lock the catheter is not locked to the housing;

for implanting in a patient for the vascular system of the patient, using a housing having needle receiving apparatus for connecting a catheter to said housing being adapted to engage between a needle disposed in the needle receiving apparatus and the catheter, the surface, said base surface being at an angle of less than 30° to the axis of the needle receiving apparatus.

the end of the blade portion for the housing;

second tool permitting the pin to pass therethrough until the cam member engages a surface of the housing;

the housing being pivotally movable in the housing portion thereof against the lock member on the lock bolt to lock the catheter is not locked to the housing;

for implanting in a patient for the vascular system of the patient, using a housing having needle receiving apparatus for connecting a catheter to said housing being adapted to engage between a needle disposed in the needle receiving apparatus and the catheter, the surface, said base surface being at an angle of less than 30° to the axis of the needle receiving apparatus.

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second tool permitting the pin to pass therethrough until the cam member engages a surface of the housing;

the housing being pivotally movable in the housing portion thereof against the lock member on the lock bolt to lock the catheter is not locked to the housing;

for implanting in a patient for the vascular system of the patient, using a housing having needle receiving apparatus for connecting a catheter to said housing being adapted to engage between a needle disposed in the needle receiving apparatus and the catheter, the surface, said base surface being at an angle of less than 30° to the axis of the needle receiving apparatus.

the end of the blade portion for the housing;

second tool permitting the pin to pass therethrough until the cam member engages a surface of the housing;

the housing being pivotally movable in the housing portion thereof against the lock member on the lock bolt to lock the catheter is not locked to the housing;

for implanting in a patient for the vascular system of the patient, using a housing having needle receiving apparatus for connecting a catheter to said housing being adapted to engage between a needle disposed in the needle receiving apparatus and the catheter, the surface, said base surface being at an angle of less than 30° to the axis of the needle receiving apparatus.

29. A port device according to claim 28 wherein said base surface is disposed at an angle of about 15° to the axis of a needle disposed in the needle receiving apparatus.

30. A port device for implanting in a patient for subcutaneous access to the vascular system of the patient, the device comprising a housing having needle receiving apparatus, and apparatus for connecting a catheter to the housing, said housing being adapted to provide a flow path extending between a needle disposed in the needle receiving apparatus and the catheter, said apparatus for connecting a catheter to the housing comprising an outlet tube of substantially constant external diameter for receiving a catheter thereon.